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The Mineral Industry of the United Arab Emirates

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The Mineral Industry of the United Arab Emirates

By Michael D. Fenton[1]

The United Arab Emirates (UAE), a federation of seven small principalities, Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, Ras al-Khaimah, and Fujairah, was one of the world's wealthiest countries. It was the most prosperous of the Persian Gulf's oil-producing states with a per capita income of about $17,000 and with oil revenues providing about 85% of Government receipts. Proven crude oil reserves in the UAE exceeded 33 billion barrels. Natural gas reserves may be as much as 111 trillion cubic feet, which was the third largest reserve of gas in the world after those of Iran and Saudi Arabia. The main centers of industrialization were Abu Dhabi and Dubai, which contained most of the hydrocarbon deposits. The remaining emirates depended on Federal assistance and aid from Abu Dhabi for their economic development.

An almost complete dependence on hydrocarbon resources continued to subject the country to external economic influences beyond its control. Oil revenues fell by more than 40% in 1986, which caused a decline in the gross domestic product by perhaps as much as 21%, but the return to oil price stability since mid-1986, and through 1987, caused a recovery of oil revenues by at least 30%. During this sharp recession, the Government apparently sought to compensate for the loss of revenue by increasing oil production while disregarding the production quotas imposed by the Organization of Petroleum Exporting Countries (OPEC). The UAE's need for revenue coincided with the buying surge of late 1987 that was generated by anxiety over rising war-related tension in the Persian Gulf and precautionary stock rebuilding.

PRODUCTION AND TRADE

Abu Dhabi contained more than 90% of the known hydrocarbon deposits and was the largest producer in the UAE. The state-owned Abu Dhabi National Oil Co. (ADNOC) was developing its oilfields through equity-sharing arrangements with several major international oil companies. Liquefied natural gas was produced from its offshore fields at Das Island, while gas from onshore fields was gathered at Ruwais.

Members of OPEC cut 1987 oil production to adhere to quotas they adopted in an effort to raise and stabilize world oil prices and to secure OPEC's share of the oil market. OPEC production fell 8.2% to 16.7 million barrels per day (bbl/d) during the first half of 1987 compared with the same period in 1986. As a result, world oil production fell 2.2% during the first half of 1987. However, OPEC production exceeded its combined quota of 16.6 million bbl/d by almost 4 million bbl/d in September because of alleged overproduction by several OPEC members, including the UAE.[2]

As in 1986, the UAE apparently did not adhere to the OPEC oil production quota.[3] Output by Abu Dhabi alone was about 1.2 million bbl/d in January, compared with the total UAE quota of 902,000 bbl/d. In deference to OPEC's call for restraint to firm softening prices, Dubai and Sharjah kept output at capacity, together producing about 400,000 bbl/d, which was maintained throughout the year. Abu Dhabi claimed to have been honoring its commitment to produce no more than 682,000 bbl/d.[4] Never-

theless, OPEC-induced production restraint kept the average output of the UAE during the first half of 1987 at 1.25 million bbl/d, compared with the quota of 902,000 bbl/d.[5] Apparently, despite frequent official denials, strong demand and firm prices prompted a sharp production rise at midyear, and that lasted throughout most of the second half. Abu Dhabi increased output to 1.4 million bbl/d to take the UAE total to 1.8 million bbl/d. Output rose during the fourth quarter and may briefly have reached 2 million bbl/d in early September.[6] Production then declined to 1.6 million bbl/d by yearend when Abu Dhabi agreed to reduce its production. The reasons for the decline were the avoidance of the dangerous Persian Gulf loading terminals by Japan, the UAE's biggest customer, and an end to the surge in orders during the third quarter. Export earnings from oil for Abu Dhabi and Dubai were about $6 billion and $2 billion, respectively, in 1987.

The UAE was Japan's largest source of oil after Saudi Arabia and Indonesia, despite a decline in volume and value of exports during the year. The value of oil exports declined by 22% below 1986 levels during the first 9 months of 1987 to $3.8 billion. Also, some Japanese liquefied petroleum gas (LPG) buyers declined to take their full LPG entitlement, some failed to renew contracts, and others were expected to cancel their contracts because of expected expansion of Indonesian productive capacity in 1988.

The Dubai Aluminium Co. Ltd. (Dubal) produced a record high 154,832 tons of finished aluminum, more than 20,000 tons above rated capacity. In sales, extrusion billet was its largest single product at 86,063 tons. Dubal expected that billet forming capacity would increase to 125,000 tons per year by late-1988. In addition, sales of foundry alloys, 99.7% ingot, and high-purity ingot were 31,038 tons, 16,835 tons, and 13,827 tons, respectively. Sales totaling 155,026 were made to 22 countries, and the largest buyer was Japan, which took 46%, 70,802 tons, of production. The United States, Taiwan, and the Republic of Korea took 29,283 tons, 11,318 tons, and 10,833 tons, respectively, while the UAE kept 9,062 tons. First-time buyers were Finland, Indonesia, and Sri Lanka. The desalination plant supplied an average 24.14 million gallons per day to Dubai, more than one-quarter of the daily demand.

Production at Ruwais Fertilizer Industries Co. Ltd. (Fertil) was a record high 378,300 tons of ammonia and 529,600 tons of urea. Local demand was met, and the number of international customers was increased. China, the biggest buyer, took 265,000 tons.

Table 1.—United Arab Emirates: Production of mineral commodities[1]

Emirate[2] and commodity[3]	1983	1984	1985	1986[p]	1987[e]
ABU DHABI					
Cement, hydraulic thousand metric tons	800	800	800	800	[e]700
Gas, natural:					
Gross million cubic feet	338,000	385,600	405,880	[e]391,000	390,000
Marketed do.	NA	355,000	[e]373,000	359,900	360,000
Natural gas liquids thousand 42-gallon barrels	[r]35,900	34,100	33,300	[e]34,000	34,000
Nitrogen, N content of ammonia thousand metric tons	--	226	282	291	303
Petroleum:					
Crude thousand 42-gallong barrels	284,000	256,047	287,700	348,555	386,230
Refinery products:					
Liquefied petroleum gas do.	1,500	1,700	2,300	[e]2,300	2,300
Gasoline do.	7,700	8,500	8,700	[e]8,700	8,700
Kerosene do.	[e]5,300	9,000	10,400	[e]10,400	10,400
Distillate fuel oil do.	[r]13,000	[r]15,400	15,000	[e]15,000	15,000
Residual fuel oil do.	[r]700	[r]14,700	11,300	[e]11,300	11,300
Naphtha do.	[r]1,900	[r]4,200	5,400	[e]5,400	5,400
Total do.	[r]30,400	[r]53,500	53,100	[e]53,100	53,100
Sulfur:					
Byproduct from petroleum refining metric tons	15,000	15,000	[e]1,460	1,460	1,460
Byproduct from natural gas do.	--	35,000	104,000	90,000	90,000

See footnotes at end of table.

Table 1.—United Arab Emirates: Production of mineral commodities[1] —Continued

Emirate[2] and commodity[3]	1983	1984	1985	1986[p]	1987[e]
DUBAI					
Aluminum, primary ingot metric tons	151,170	155,333	153,186	154,838	[4]154,832
Cement, hydraulic thousand metric tons	350	800	800	800	[4]500
Gas, natural:[e]					
Gross million cubic feet	150,000	107,000	[4]185,560	200,300	200,300
Marketed do.	120,000	43,400	[4]75,220	[4]81,220	81,200
Natural gas liquids:					
Propane thousand 42-gallon barrels	10,000	10,000	4,000	[e]4,300	4,300
Butane do.	8,000	8,000	2,500	2,700	2,700
Natural gasoline do.	9,000	9,000	2,555	2,800	2,800
Petroleum, crude do.	121,830	116,400	128,200	127,400	[4]137,810
FUJAIRAH					
Cement, hydraulic thousand metric tons	520	550	550	500	[4]380
RAS AL-KHAIMAH					
Cement, hydraulic do.	1,200	1,200	1,200	360	[4]890
Gas, natural: Marketed million cubic feet	--	NA	4,590	[e]4,600	4,600
Lime[e] thousand metric tons	45	45	45	45	45
Natural gas liquids thousand 42-gallon barrels	--	2,120	3,640	4,680	4,700
SHARJAH					
Cement, hydraulic[e] thousand metric tons	685	700	700	330	[4]280
Gas, natural:					
Gross[e] million cubic feet	40,000	152,000	219,000	219,000	219,000
Marketed do.	13,800	18,793	23,700	23,700	[4]23,725
Petroleum, crude and condensate thousand 42-gallon barrels	13,800	18,793	23,400	23,700	[4]23,725

[e]Estimated [p]Preliminary [r]Revised NA Not available.

[1]Table includes data available through July 22, 1988.

[2]In addition to the emirates listed, Ajman and Umm al-Qaiwain report no mineral production but presumably produce small quantities of crude construction materials.

[3]In addition to the commodities listed, crude construction materials such as common clays, sand and gravel, and stone presumably are produced, but output is not recorded quantitatively, and general information is inadequate to make reliable estimates of output levels.

[4]Reported figure.

COMMODITY REVIEW

METALS

Aluminum.—Planning continued by Umm al-Qaiwain Aluminium Co. (Umalco) to establish the 240,000-ton-per-year aluminum smelter in Umm al-Qaiwain. Design and preliminary costings were nearing completion by the technology consultant for the project, Aluminum Co. of America. The industrial complex was to include a 595-megawatt power station and a 25-million-gallon-per-day desalination plant. Surplus electricity and water would be sold to the local authorities.

Aluminum sales contracts were established for a period of 12 years after the start of production, which was scheduled for year-end 1989. The China National Metal and Minerals Import and Export Corp. and the Everbright Aluminium Co. of China agreed to take 78,000 tons per year each, while a joint venture between the Japanese company Furukawa Mining Co. Ltd. and Southwire Corp. of the United States agreed to buy 120,000 tons per year, and Austria Metal Co. would purchase 25,000 tons per year.

Although a guaranteed source of an estimated required 130 million cubic feet per day of gas required for power generation was not secured, the most likely source would be Sharjah's Sajaa Field, which had surplus capacity, or the offshore Mubarak Field. The Mubarak Field, which was not producing gas commercially, would require a heavy investment in cleaning and compression facilities. The offshore Bukha Field owned by Oman was another possible source of gas.

Copper.—After a decade of intensive exploration, drilling in 1986 and 1987 for copper in rock units that were correlative with copper-bearing units in nearby Oman appeared to have established that the copper potential of the country was low.

INDUSTRIAL MINERALS

Cement.—The duty charged by Oman on cement imports was more than doubled from 20% to 50% to the detriment of UAE producers who were trying to maintain sales in a shrinking market. The UAE's eight cement producers had an annual capacity of about 7.6 million tons, but annual production was only 2.8 to 3 million tons, less than 40% of capacity. Local demand was about 1.6 million tons, and sales to Oman were 10,000 tons per month according to a quota system.

Fertilizer Materials.—Construction of a $71 million, 165,000-ton-per-year phosphoric acid plant was to begin in late 1987 at Jebel Ali, Dubai, by Emirates Narmada Industries, a joint venture of India's Gujarat Narmada Valley Fertilisers Co. and the Cayman Islands-based investment company Mozak International. Rock phosphate for the plant was expected to be supplied by Jordan, Morocco, or Togo. Since agriculture contributed only 2% to the gross national product, and since the UAE was giving priority to livestock breeding and fishing, there were no immediate plans to develop any downstream fertilizer capacity at Jebel Ali. The total phosphoric acid output was to be sold to diammonium phosphate manufacturers in India for use as feedstock for fertilizers. The UAE had a significant logistical advantage, and significant savings were expected by India by avoiding the freighting of bulky phosphate rock to India. A new desalination plant would use energy from the associated sulfuric acid plant, and byproduct gypsum may be available for sale. The plant was to be built to use the Norsk Hydro hemidihydrate process for the production of phosphoric acid.

Strontium.—A high-quality celestite deposit near the 119-million-ton gypsum deposit at Al Ain was investigated by TerraHunt Geoscience Ltd. of the United Kingdom and was found to be suitable for marketing and use in the manufacture of color television tubes. A viable mining operation was indicated by a prefeasibility study.

MINERAL FUELS

Natural Gas.—Gulf Oil Ras al-Khaimah, the operator of Saleh Field, sold its 50.46% share in this offshore concession, and a new company, Ras al-Khaimah Offshore Petroleum, was established to operate the field. Six wells were producing about 74,000 cubic feet of gas per day and about 6,000 bbl/d of condensate for sale on international markets.

One year after commissioning in May 1986, the Sharjah Liquefaction Co.'s LPG plant at Al-Hamriyah was producing 7,000 bbl/d of propane, 5,000 bbl/d of butane, and more than 4,000 bbl/d of condensate from 400 million cubic feet of wet gas per day. The plant was designed to produce 13,000 bbl/d of LPG and 4,600 bbl/d of condensate from 440 million cubic feet of gas.

Two gas discoveries were made in the onshore Bab and Bu Hasa onshore concessions operated by Abu Dhabi Co. for Onshore Oil Operations (Adco). Gas was found in the Habshan 3 and Thamama Zones of the Bab Field, and the Arab A, C, and D reservoirs of the Bu Hasa Field. Estimated reserves were 3.3 trillion cubic feet of natural gas.

Petroleum.—*Exploration and Development.*—Australia's BHP Petroleum Ltd. was to start a seismic survey offshore Fujairah in mid-February, and was planning to spud an exploratory well in late 1988 in a concession offshore from Oman, which borders Fujairah.

International Petroleum Corp. of Canada obtained an onshore concession agreement to explore for oil in northern Ras al-Khaimah. The acreage is adjacent to two producing areas, the Margham Field and the Sajaa Field, which were producing a combined 70,000 bbl/d.

The first exploratory well drilled in Sharjah in 4 years was planned by Amoco Sharjah Oil Co. to be drilled in August, onshore, south of the South Juweiza well that was drilled in 1983.

The new offshore Satah Oilfield in Abu Dhabi, scheduled for commissioning in March with an initial production capacity of 12,000 bbl/d, was to have nine dual oil-producing wells, two gas-injector wells, one gas-producing well, and nine dumpflood-injector wells. Umm Addalkh Development Co. (UDECO), a joint-venture operating company owned by ADNOC and the Japanese Oil Development Co., planned to raise the initial production capacity of 12,000 to 17,000 bbl/d. This output, when combined with UDECO's other offshore field, Umm Addalkh, would then average about 28,000 to 30,000 bbl/d. Abu Dhabi Oil Co. announced plans at yearend to start production from the Umm al-Anbar offshore oilfield at a rate of 10,000 bbl/d. Reserves were about 40 million barrels.

Production.—Changing economic conditions required continuing reductions in op-

erations of Adco that began in 1985. Adco agreed to cut its 1987 budget by more than 37% compared with 1986 estimated actual spending. The 15 rigs working in early 1986 were reduced to 11 by yearend 1986, to 6 by mid-1987, and 4 during the latter half of the year.

Production capacity of 440,000 bbl/d at the Bu Hasa Oilfield was expected to rise to 500,000 bbl/d when a program was completed to improve the oil-gathering system. Associated gases at Bu Hasa were processed on-site to extract natural gas liquids, which were then pumped to Ruwais.

Production resumed at Abu Dhabi's Abu al-Bukhoush Oilfield at 30,000 bbl/d, one-half of capacity, after being damaged by war planes in November 1986.

British Petroleum Arabian started its 30,000-ton-per-year lubricants plant at Jebel Ali, Dubai, at a rate of 20,000 tons per year.

Petrochemicals.—Construction began in the United Kingdom on a $1.6 million, skid-mounted cryogenic purge-gas recovery plant for Fertil that would enhance ammonia production at its Abu Dhabi complex.

Fertil, which makes and exports liquid anhydrous ammonia and urea for fertilizers, borrowed $13 million for the construction of a urea storage plant and hydrogen extraction unit.

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[1]Physical scientist, Division of International Minerals.
[2]Oil and Gas Journal. Sept. 14, 1987, p. 21.
[3]Middle East Economic Digest. Feb. 21, 1987, p. 27.
[4]Work cited in footnote 3.
[5]Middle East Economic Digest. Dec. 19, 1987, p. 77.
[6]———. Special Report. Nov. 1987, p. 2.

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